

1.2 Cells: Origin & Ultrastructure

Question Paper

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|------------|------------------------------------|
| Course | DP IB Biology |
| Section | 1. Cell Biology |
| Topic | 1.2 Cells: Origin & Ultrastructure |
| Difficulty | Medium |

Time allowed: 20
Score: /10
Percentage: /100

Question 1

Which of the following is **not** a correct description of a light microscope or an electron microscope?

- A An electron microscope can resolve specimens as small as 0.5 nm in diameter.
- B A light microscope has a maximum resolution of 0.2 μm .
- C An electron microscope has a maximum resolution of 0.05 nm.
- D A light microscope can resolve specimens as small as 200 nm in diameter.

[1 mark]

Question 2

The table shows some possible units for measuring the diameters of alveoli, white blood cells and the width of cell walls.

Which of the rows show the most suitable units for measuring each of these structures?

| | Diameter of alveoli | Diameter of white blood cells | Width of cell walls |
|----------|---------------------|-------------------------------|---------------------|
| A | mm | μm | μm |
| B | mm | μm | nm |
| C | μm | nm | μm |
| D | μm | μm | nm |

[1 mark]

Question 3

The list below contains structures that are all features of eukaryotic cells.

- I. Nucleus
- II. Endoplasmic reticulum
- III. Lysosome
- IV. Chloroplast
- V. Mitochondrion

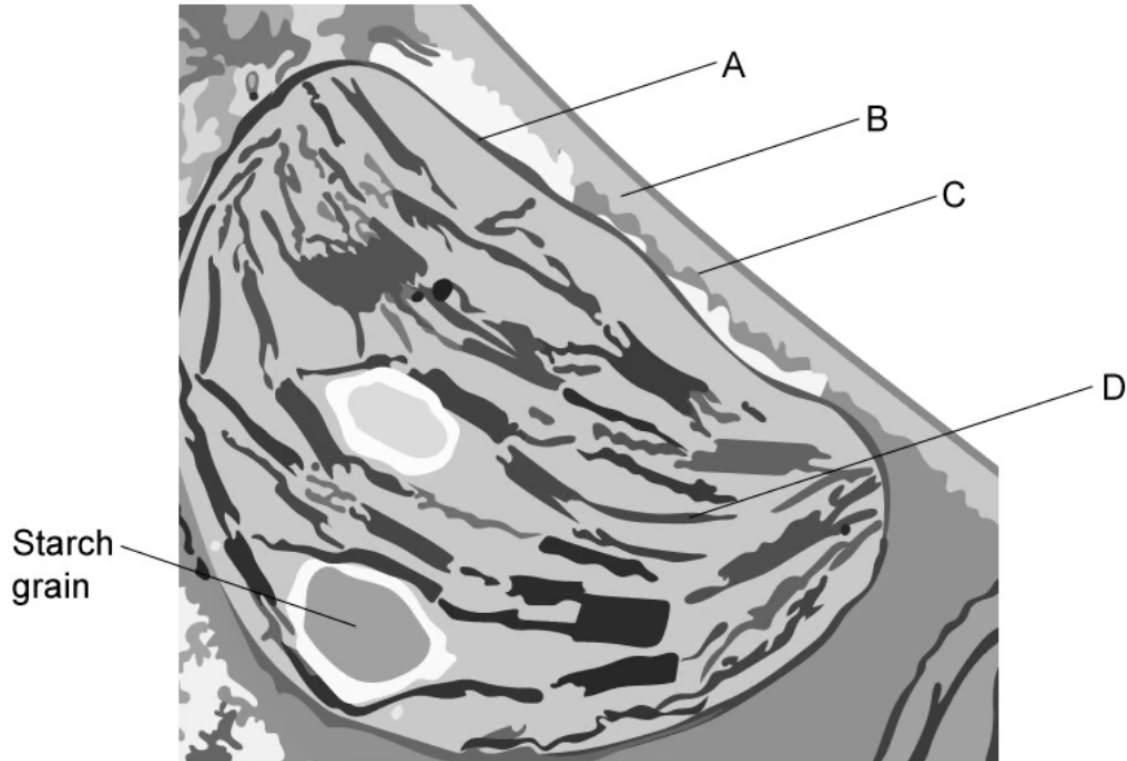
Which of these structures will have a double membrane?

- A** I, II and III
- B** I, III and IV
- C** I, IV and V
- D** II, III and IV

[1 mark]

Question 4

The electron micrograph below shows a section of part of a palisade mesophyll cell.



Which structure controls the exchange of substances into and out of the cell?

[1 mark]

Question 5

Which set of observations would indicate that a student is observing a eukaryotic cell?

| | Cytoplasm includes endoplasmic reticulum | Protein molecules are associated with the DNA | Diameter <1 μm |
|----------|--|---|---------------------------|
| A | X | ✓ | X |
| B | X | X | ✓ |
| C | ✓ | ✓ | X |
| D | ✓ | X | X |

[1 mark]

Question 6

Membrane-bound sacs containing products of metabolism are produced by the endoplasmic reticulum.

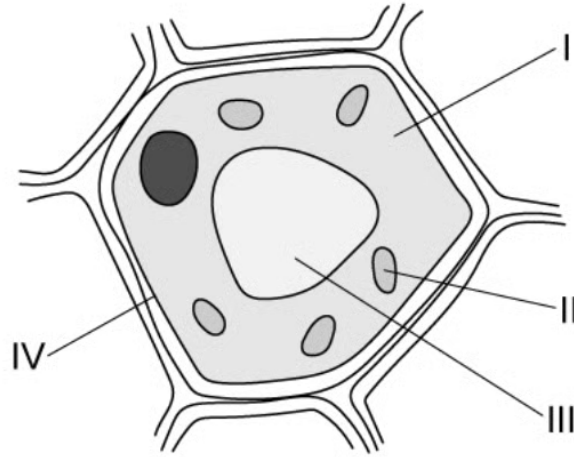
Where are these products used?

- A** Inside lysosomes only.
- B** Outside the cell only.
- C** Inside the cell only.
- D** Inside and outside the cell.

[1 mark]

Question 7

The diagram shows a typical plant cell.



Which of the cell components would be present in prokaryotes?

- A** I only
- B** II only
- C** II and III
- D** I and IV

[1 mark]

Question 8

The following statement describes some of Louis Pasteur's findings:

Broth was first boiled, killing all organisms in it. The broth was then transferred to a swan-necked flask, which prevented organisms from entering. The result was that no organism subsequently grew in the broth. The swan-necked flask was then broken. The result was that mould subsequently grew in the broth.

What did these findings suggest?

- A** Mould needs nutrients in order to grow.
- B** Aerobic respiration requires the presence of oxygen.
- C** Mould is a form of microorganism.
- D** Spontaneous generation of cells does not occur.

[1 mark]

Question 9

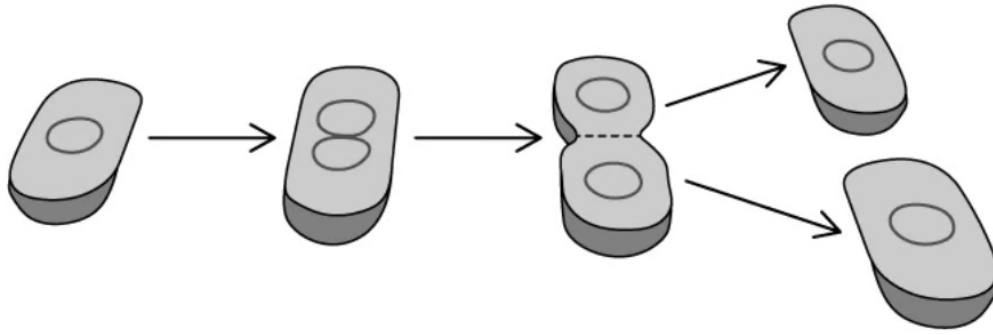
Which of the following is evidence for the endosymbiotic theory?

- A** 70S ribosomes can be found in prokaryotic cells.
- B** Mitochondria contain their own DNA.
- C** Meteorites have been found that contain organic molecules.
- D** In certain cases, gene transfer from prokaryotic cells to eukaryotic cells via plasmids has been found to occur.

[1 mark]

Question 10

Which process is occurring in the diagram below?



- A** Binary fission
- B** Cytokinesis
- C** Mitosis
- D** Meiosis

[1 mark]